

SOME ACCOUNT
OF THE
WALTON WATER,
NEAR
TEWKESBURY;

WITH

Thoughts on the Use and Diseases

OF THE

LYMPHATIC GLANDS.

IN A LETTER

TO

*J. B*****d - J. B. D. J.*

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—*Sacros Ausus recludere fontes.*

W O R C E S T E R :

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PRATT, Bath; and JACKSON, Oxford.



T H E

P R E F A C E.

*T*HOUGH Walton Water, is here held out, as possessing the same Properties, and Medicinal Powers as Cheltenham Water, it is not done with the most distant View, to lessen the Reputation of that Water, and the Resort to Cheltenham. On the contrary, it is presumed, it will be a Satisfaction to Invalids to be assured of having, within a small Distance, a Water of the same Kind, to which recourse may be had, when the Numbers are so great at Cheltenham, as to be insufficiently supplied from the Well there.

In this point of View, the Water near Tewkesbury must be useful to Cheltenham in full Seasons, and, cannot injure it in any one, as its priority in use, and, the habit of Resort for Amusement as well as health will give Cheltenham the Preference.

Tewkes-

Tewkesbury, however, has equally a Right to the Benefit of its natural Riches, and to the Advantages which may accrue to it from the Vicinity of Walton Waters in particular. This Borough is situated on a fertile Plain, at the Conflux of the River Avon with the Severn. The Town is well built, and now well paved, and, Provisions of every Kind, particularly the finest Salmon, are in great plenty. It communicates by a very good Road, to fine rides towards Worcester, Upton and Malvern, and is only eight Miles from Cheltenham.

In these rides, the various Views of a most Picturesque Country, charm the Eye, and make the salutary Exercise of riding delightful. Malvern, rising in benign Majesty, diffuses all around a pure and temperate Air; a Water exceeding all others in elementary Purity; which every Year manifests its salubrity in curing Diseases which have baffled the Power of Medicine in other Situations.

Tewkesbury, and its Environs, besides the striking beauties of the Country, present to the Observation of the curious; A Field of Battle where a Victory was obtained, which fixed the Crown on the Head of Edward IV. A Church, one of the finest Gothick Structures in England; in which lie the
Remains

*Remains of Edward Prince of Wales, Son of Henry VI.
cruelly murdered in cold Blood, with the Duke of Somerset,
and many other Noblemen and Gentlemen who shared his Fate
after that decisive Battle.*

———*Sacros Ausus recludere fontes.*

*My Motto, is proper in more Senses than one ; for taking
Advantage of the Epistolary Form ; I have attempted to illu-
strate the Use of the Lymphatic Glands, acknowledged to be hither-
to undiscovered, as well as to make known the properties of a
new Medicinal Water.*

E R R A T A.

P. 4, l. 15, *for* 1736 *r.* 1786—p. 7, l. 7, *for* on Solution, *r.* in Solution—p. 8, l. 17, *after finally* a comma—p. 14, l. 10, *for* Catharatic, *r.* Cathartic—p. 16, l. 12, *for* pleniful, *r.* plentiful—ib. l. 33. *for* Civilian, *r.* Savilian—p. 22, l. 11, *for* exite, *r.* exit—p. 27, l. 17, *for* splendily, *r.* splendidly—ib. l. 18, *for* his, *r.* this—p. 29, l. 30, *for* Cruickthank, *r.* Cruikthank *passim*—p. 31, l. 3, *for* pericordium, *r.* pericardium—p. 40, l. 22, *for* stated, *r.* seated.

S I R,

AT length, I send you, an account of the Experiments, made on the Medicinal Water near Tewkesbury, of which, so much has been said at Cheltenham, in the course of this Season and the last.

I first heard of this Water in passing through Tewkesbury in 1786. It had been for some time resorted to, by Persons in the Neighbourhood, and, was reported to have effected Cures in the Diseases, for which the Cheltenham Water is found to be so efficacious, and, on account of which, Persons of every Rank, resort to that Place in such Numbers, as to exhaust sometimes the Spring on which they rest their hopes of recovery.

This Well is situated near Walton, a Village about a mile from Tewkesbury, upon an estate belonging to Nicholas Smithsend, Esquire. The Ground about the Well is a deep Clay Soil, under which, at the depth of about seven or eight yards, runs a Stratum of blue slaty Stone; on piercing this Bed of Stone, plentiful Springs of Water arise, which are always more or less impregnated with Salt.

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The Well, of which I write, is about twenty feet deep.

The Water from the Pump, or soon after, has a soft, almost Oleaginous taste, numerous Air Bubbles rise, and sparkle in the Glafs; after it has been drank, it leaves the Chalybeate, and Saline tastes on the tongue, and when shook in the Bottle, the Hepatic smell is very perceptible.

Its resemblance in taste, and other appearances to the Cheltenham Water, strikes every one who makes the comparison.

Its operation on the Body, also, is exactly the same, a Pint or more, acts as a gentle Laxative and Diuretic: And it occasions a slight giddiness in some persons, in others a sort of heavy pain in the head.

These tests, though of themselves, sufficiently convincing, will be confirmed by the Experiments which I made on the Walton Water, in the Summer of 1786, and this Summer, in which I had the assistance of the worthy Surgeons, and Apothecaries, at Tewkesbury, particularly Messrs. Terrett, Dillon and Spilbury, who are in very deserved estimation, there. 1. When the Walton Water is mixed with Clear filtered
Lime

Lime Water, it becomes immediately cloudy, and, a copious white scaly precipitation ensues.

The same cloudy appearance arises in Lime Water, when the Air, separated by Heat from the Walton Water, is conveyed by a Pipe and Bladder, connected with the two Bottles, into the Bottle, containing the Lime Water, and shaken with it.

If the Walton Water has been taken from the Well, twelve or more hours, the precipitation by Lime Water, does not take place immediately, in the manner it does in a Glass of Water from the Pump.

White Arsenic, dissolves more readily in the Walton Water, than in common Water, and renders the Hepatic smell thereof, stronger and more perceptible.

2. When Walton Water, fresh from the Pump, is mixed with an Infusion of Green Tea, the mixture assumes a Purple Colour, and by standing, the Colour becomes deeper.

3. A Solution of Saccharum Saturni, mixed with fresh-drawn Water, becomes brown, and is followed by a blackish precipitation. This is a test of the presence of Hepatic Air,

which also discovers itself in this Water, by its characteristic Sulphureous smell. This often is produced by putrifying Vegetables. Bishop Watson, observes, that Sulphureous Waters are produced in Morasses and Bogs, from rotten Wood; that Shale, a stone so called, of which there is a Stratum, extended all over the Country about Harrowgate, and from which the Sulphur Springs there arise, contains both Vitriolic Acid and Phlogiston, the constituent parts of Sulphur; and some pieces of Shale, when calcined properly, have been found to communicate the Sulphureous impregnation to Water, Ph. Transf. 1736. It is sufficient to observe, that Walton Water emerges from a bed of stone, probably similar to this, and that the Soil abounds with the remains of rotten Vegetables resolved into it, and, that from one or both these sources, it derives the Hepatic Gas perceived in it.

4. After Walton Water has been drawn from the Pump ten or twelve hours; it no longer becomes purple or blackish, by the addition of astringents, (No. II.) and a precipitation with Lime Water, does not immediately ensue, (No. I.)

5. Its Colour neither becomes Green nor Red, with Syrrup of Violets.

6. It

6. It does not effervesce with the Vitriolic or Nitrous Acids.

7. It becomes milky by mixture, with the fixed Alkali, and more so with the Volatile Alkali prepared with Lime.

8. Solution of Silver, makes it milky and a flaky precipitation subsides.

9. Two ingenious friends, and accurate observers, found the whole fixed contents of the Water left by evaporation, amounted to one ounce in a gallon.

10. After various evaporations, I found it yielded exactly that quantity.

When a Gallon of the Water is reduced by evaporation to two ounces and under, a considerable quantity of an earthy powder remains in the vessel in which it was boiled. And when the liquid is set to cristallize, Chrystals, in shape and size, resembling the Glauber salt are formed. They are hexagonal, and when dried in the Sun, are calcined into a white powder. The taste cool and bitter.

Some cubical Chrystals of marine salt, and, a deliquescent bitter lixivium remains.

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The powder, dropped by boiling in the vessel, consists of Magnesia, and an absorbent earth, which entirely dissolve in Vinegar, with considerable effervescence.

The quantity of large Chrystals amounted to six drachms or more, from a Gallon of Water, evaporated in 1786; but by after experiments, I find this impregnation is not constantly in the same quantity, and proportion.

II. Lastly, the Chrystals of the Walton Water; and the white powder into which these dried Chrystals fall; when dissolved, the Solution is again perfect, and clear in an exceedingly small quantity of Water.

Salt of Tartar, added to this Solution, becomes Milky and a copious white sediment subsides, found to be Magnesia.

Lime Water added to the Solution, occasions a Milky whiteness, and a soft Alkaline precipitation, but it does not happen near so soon as that made by salt of Tartar.

EXPE-

EXPERIMENT I.

SHEWS Walton Water abounds with fixed Air. Lime becomes quick, calcined or caustic, by the expulsion of this Air by fire ; and being attracted again from this Water, the Calcareous Matter before held in Solution, becomes mild and precipitates in form of a clear and white powder. The immediate precipitation, which takes place by the mixture of Walton Water with Lime Water, and still more clearly the Air forced from Walton Water agitated with Lime Water, is therefore a certain test of the presence of fixed Air in Walton Water.

2. By this experiment, Iron in a small quantity, appears to be one of the Fugitive ingredients in the Walton Water. This, as well as some absorbent earth, is kept in a dissolved state by the fixed Air, and the Sulphureous Gas contained in it : When the fixed Air flies off, which it does much sooner than the Hepatic Gas, the Iron precipitates, and the Water is no longer capable of becoming Purple by astringents. The action of heat carries off the Hepatic Gas, which appears to hold the absorbent earths in Solution, which

which are left by evaporation ; and to which the soft, almost oleaginous taste, with which this Water strikes the tongue, is probably owing.

3. The addition of Saccharum Saturni discovers the presence of the Hepatic Air, another fugitive principle contained in this Water, as well as in that of Cheltenham : But it is much less fugitive than fixed Air, being often perceived, both in the Cheltenham and Walton Waters, after they have been bottled a considerable time. This Sulphureous or Hepatic Air, found in this and in other Waters, has been the occasion of much controversy among the Gentlemen who have analyzed Waters : Mr. Kirwan, has probably finally settled the dispute, by shewing that Hepatic Air is no other, than actual Sulphur kept in Solution, in an aerial State, by union with the matter of heat, Ph. Tr.

4. It is evident, from this article, that the fixed Air only dissolves and keeps Iron suspended in the Water. Its disappearance so soon, shews its very volatile Nature, and, the necessity of resorting to these Springs, to have the benefit of a principle and ingredient, which gives penetrability, and action to the Saline contents of the Waters.

5, 6. Shew

5, 6. Shew the Salts contained in these Waters are neutral: And, that neither the acid nor the Alkali, of which they are compounded, prevail.

7---11. Demonstrate, that Vitriolated Magnesia, is a part of the purgative Salt contained in the Walton Water. The attraction of an Alkaline Salt, and especially that of the caustic Alkali, with the Vitriolic Acid, is greater than that of the Magnesia, which is precipitated in these experiments.

8. The existence of Sea Salt, is manifested by this experiment, and by the entire Chrystals, formed in the residuum, by christallization.

9, 10. From all our experiments, fixed Air dissolving a small quantity of Iron: Hepatic Air, united with an absorbent earth, appear to be the fugitive ingredients of the Walton Water. The fixed ingredients discovered by evaporation, and christallization, appear to be a Vitriolated Mineral Alkali, or, a Glauber Salt, united with Vitriolated Magnesia, in the quantity of six or seven drachms, in one Gallon of Water. Magnesia, Lime and absorbent earth, and a deliquescent bitter Lixivium, consisting of salited Magnesia and Lime, with a few grains of entire Sea Salt, altogether, about a drachm or two to a Gallon.

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That these also are the component Medicinal ingredients in the Cheltenham Water, appears by the analysis, of the learned Dr. Fothergill, of Bath.

This Gentleman, in his very valuable experimental inquiry into the nature and qualities of Cheltenham Water, p. 42, concludes, “from the preceeding experiments, a Gallon of the Water, wine measure, appears to contain the subsequent principles, nearly in the following proportions; Native Glauber Salt, with a portion of Epsom Salt, one ounce; Sea Salt, five grains; Iron combined with fixed Air, five grains; Magnesia combined with fixed Air, twenty-five grains; Calcarious earth, or Selenite, forty grains; fixed Air, combined with phlogisticated Air, twenty-four ounce measures. To these may, perhaps, be added a small proportion of Hepatic Gas, or Hepar Sulphuris converted into Vapour by the separation of its phlogiston.”

By this ingenious work, it appears, and, is sufficiently known to all who frequent Cheltenham, that the Iron is very soon precipitated from the Water, after it is drawn from the Pump; and, in a short time it cannot be made to assume a purple colour, by the addition of astringents.

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The Salts of the Walton and Cheltenham Waters, are both soluble in a very small quantity of Water, equal to their weight nearly : And their impresson on the human senses, and, their action on the bowels, is the same.

In so many points, the Cheltenham and Walton Mineral Waters, are entirely like each other ; a pint or less of each opens the body ; some find a small addition of the Walton, necessary to produce the same effect in the same degree ; others find no difference ; the purgative Salt is somewhat less, about a drachm in a gallon, in my experiments ; but the quantity of fixed Air, and Steel are at least equal. The Hepatic Air seems to prevail in the Walton Water, over the Cheltenham, which gives it a most pleasing almost Oleaginous softness, and makes it highly grateful in taste, and gentle in operation, and, far more suitable in diseases of the kidneys, and urinary passages, than the Cheltenham Water itself.

Without, therefore, entering into a farther detail of Chymical research, I apprehend the similarity of the Walton to the Cheltenham Water, to be sufficiently ascertained, to warrant its use and application in the diseases, for which Cheltenham Waters have been used with advantage.

The analysis of Mineral Waters, undoubtedly is highly useful; but notwithstanding the perfection to which it is carried by discoveries in modern Chymistry, I apprehend it gives a very imperfect idea of the real composition of Waters; in short, such an idea as dissection gives of an animated body, a view of its parts disjointed, and separate, very different from that union, on which symmetry and life depend.

It is on this account, that the exhibition of the ingredients found to compose Mineral Waters, and the imitations of many of them, administered as Medicines, fall short of the Waters prepared by nature, especially when drank at the sources.

It is the same in other parts of the *Materia Medica*: An analysis, in some measure, assists in accounting for the operation of a Medicine, but seldom enables us to prepare, and compound to perfection, the natural productions we pretend to imitate.

The use, and advantage of Waters, is established by experience alone, as well as that of every article in the *Materia Medica*. The advantages found from the use of the Walton Well, in various eruptive diseases, and in old fordidulcers, as well as in many other diseases,

has already been so considerable, as to confirm the expectation grounded on their being similar to the Cheltenham Water.

It will undoubtedly be found as much like Cheltenham Water, as that Water is like itself at different seasons. Seasons occasion accidental differences of saturation in all Mineral Waters, the cause of which, is sometimes known, and sometimes is unknown. Rainy seasons, while they make Springs more abundant, render the Mineral impregnation at the same time weaker. To this alteration, the Walton Water must be sometimes liable, as it lies on a plain, part of which is frequently overflowed with Water. But if by experience, this shall be found to have any considerable influence, means will be used to remove the inconvenience. An inconvenience which is very seldom likely to happen in dry and warm seasons, in which Waters of this class, are for the most part resorted to.

After all, I am persuaded, that the dilution of Mineral Waters is very seldom any injury to the patient. The virtues and powers of Mineral Water, depending principally on the quantity of Water, the medium, in which the Medicinal ingredients are suspended; the vehicle which conveys them into the smallest vessels, and, makes them capable of removing

ing obstructions fixed in them, and in various glands ; hence the same Medicinal ingredients, given in the usual forms, have but little efficacy in removing such diseases.

The healing powers of the Walton Well, and those of its elder Sister of Cheltenham, are owing to the mixture of a neutral compound of vitriolated Magnesia, commonly called Epsom, or cathartic Salt ; to vitriolated Mineral Alkali, or Glauber Salt, with a small portion of salited Mineral Alkali, Magnesia, and Lime, nearly to the quantity of a drachm, in a pint of Water ; also, to a considerable quantity of fixed Air, and Hepatic Gas, by the former of which Iron, and by the latter Magnesia, and absorbent earth are held in Solution.

The whole is a composition, friendly to appetite and digestion ; as well as soft, and pleasing to the taste. It is also a penetrating deobstruent, and, attenuating medicine, and in sensible operation, a quick and gentle laxative and Diuretic ; and, when applied with discretion, it may be continued a long time without any diminution of strength.

It is obvious, this Water contains Saline ingredients, and, others possessing different attractive powers and affinities, which, though
balanced

balanced in the Water ; yet, when mixed with animal fluids, and Salts in the course of digestion, Chylification, and in circulation with the blood, must be so changed, and varied as to form new attractions, and combinations in their course through the vessels, whence compounds possessing properties, different from what existed before, will be produced, and the system itself will be changed. It is well known, that cold is generated by dissolving Salts ; and, that while Saline Bodies, of different affinities, and attractive powers, are forming new compounds ; such Salts in the process of mutual attraction, and incorporation, produce heat. In this manner, and from such causes, new stimuli, with other alterations take place in the glands, and remoter vessels of our system, from the Salts, combined with other ingredients in Mineral Waters ; and, it is by these means, as well as evacuation, they become beneficial, and are really valuable alterative Medicines.

The Walton Waters, being a compound, *sui generis*, similar to Cheltenham, they both operate primarily, and principally on the intestines, as a gentle purgative, “ Their mode
 “ of operation, (says Dr. Smith, p. 21, 22.)
 “ upon the intestines, producing an easy,
 “ sudden discharge, is explainable upon the
 “ principle of the tenuity, and uniform
 “ diffusion

“ diffusion of the ingredients in the Water.
 “ For the Water, after having performed its
 “ strengthening, and exhilarating office upon
 “ the stomach, passes quickly into the intestines
 “ as fluids do, carrying along with it,
 “ more or less of all its ingredients, but particularly
 “ its great dilution, and consequent
 “ dispersion all over the internal surface of
 “ the canal, vellicates the innumerable, little
 “ exhalent vessels, with which that cavity is
 “ crowded, into a plentiful secretion; and
 “ notwithstanding the stimulus may be but
 “ slight on any particular part, on account
 “ of the minuteness of the particles of the
 “ Salt; yet, as they are universally diffused,
 “ and act upon the whole system of exhalents
 “ at once, a more copious and expeditious
 “ evacuation is produced, than what is often
 “ attainable from a much larger quantity of
 “ any of the other more stimulating purgatives
 “ less attenuated; attended at the same
 “ time with these important advantages;
 “ that as the stimulus is gentle, no griping
 “ pain is likely to be excited, and as it is
 “ superficial, the particles must soon be
 “ washed off in the general current, without
 “ leaving behind them any of those
 “ disagreeable feelings that usually hang in
 “ the rear of other Catharticks.”(a)

Corollary

(a) See Observations on the use and abuse of Cheltenham Waters,
 by J. SMITH, M. D. Civilian Professor of Geometry, Oxford.

Corollary. Mineral Waters in general, derive their healing powers much less from the metals, earths, and, Salts, often inconsiderable in quantity, which remain after evaporation, than, from the volatile principles, united with them, but diluted in a very great proportion of Water ; and, they universally owe the activity the whole possesses, to the incorporation of the volatile and fugitive principles, both with the Water, and, with the grosser ingredients, combined together most intimately.

THE taste of the Walton Water, fresh from the Spring, as has been already observed, is at first soft, and, afterwards agreeably Saline ; the Sulphur and Iron, are also plainly tasted in it, in the quantity of a pint, and, often less, it occasions two or three lax stools, and, operates without the least sickness, griping, or any kind of inconvenience.

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The quantity of urine is also encreased ; it sits easy on the stomach, and, appetite is promoted.

The volatile principles fly off, soon after the Water is removed from the Well ; and, as these are so essential to its efficacy, and, render it agreeable to the taste and stomach, and, carry the Saline, invigorating, and deobstruent contents of the Water into the vessels and glands, it is necessary to drink them from the Pump, or very soon afterwards.

These Waters not only remove costiveness, but encrease appetite, and, the powers of digestion. The chylication of digested aliment is more perfectly elaborated, and, the errors of the first digestion prevented, and, remedied in an effectual manner ; whatever is injurious to health in the stomach and intestines, acidity, bilious, putrid matter are carried out of the body. Worms, and, their nidus are expelled. In this manner the seeds of disease will be prevented in the chyliciferous vessels ; and the Chyle itself being highly elaborated, and, withal diluted with the Water, enters the lacteals possessing, such qualities and powers, as bid fair to obviate, and remove obstructions which have taken place in the channels of the chyle and lymph.

Hence

Hence, obstructions in the mesentery and glands will gradually be resolved, as this Water will be likely to dilute, and dissolve any tenacious matter, incapable of moving in the chyli-ferous vessels, on account of its glutinous, cheese like, and, steatomatous consistence, and, will stimulate the vessels, and, mesenteric glands, by its Saline contents, so as to enable them to push on any obstructing matter.

Some portion of the Waters, being absorbed into the vena portarum, will act as a powerful deobstruent in obstructions of the liver.

By thinning the Hepatic bile, and, carrying that fluid regularly into the intestines. By preventing the stagnation of bile in the gall-bladder. By gently stimulating the biliary vessels, and, encreasing their action. In a word, by the united influence of these powers, recent obstructions, or older scirrhoties, which have taken place either at home, or by residence in warm climates, will be remedied.

Calculous concretions in the biliary ducts, and, in the gall-bladder, when of a size capable of being carried into the intestines, will be disposed and moved thither, by that stimulus, which acting originally on the

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duodenum

duodenum, will extend its influence along the Ductus Choledochus. In like manner, new concretions of the biliary kind, will be effectually prevented.

So that this Water will be found a very effectual remedy for jaundice arising from gall-stones as well as from other causes, obstructing the discharge of the bile into the intestines. It will also be found useful in removing obstructions in the substance of the Liver; and, in preventing hemmorrhoidal, and, other discharges of blood, which most frequently originate from obstructions in the Liver.

Hemmorrhoidal swellings, and, discharges of blood from other causes, obstructing, or retarding its motion, and, return through the branches of the vena portarum, will be eased or relieved by a seasonable use of this Water.

The softness, which is peculiar to this Water, renders it proper in diseases of the urinary passages; as it acts powerfully on the Kidneys, and, occasions an encreased secretion there, as well as in the intestinal tube; gravelly concretions will be prevented or washed away. As the secretion of urine is in experience, found essential, for carrying out of the body, the Salts, and oils, which are
preju-

prejudicial to health ; the purity of blood will be very greatly promoted by the encrease of this secretion ; so that by the free discharge from this emunctory, along with that from the alimentary canal, the skin will be cleansed from hot red eruptions, and, from scaly, and scabby incrustations, which notoriously arise from, a blood, and habit overloaded with acrid, and impure matter ; when by excess in diet, or by improper food, by imperfect digestion, or inadequate secretion and excretion, such acrid corrupt matter is formed, and retained in our bodies. Gentle evacuation, by the use of such Waters, is generally a certain relief under these circumstances ; this has been experienced by various persons, but very remarkably by one Tanner from Kidderminster, who has had a leprous eruption removed from his face, and other parts, by drinking the Walton Water, and, applying it externally ; which relief, for six years past, he had not obtained by any means whatever.

The preserving the bile in a fluid state, and, the regular conveyance of it into the duodenum, will powerfully operate in completing the digestion, and, Chylification of the food ; and, will give the blood those properties, which support the health, and, vigour of the body.---With that all cutaneous foulness will disappear, and, the bloom of beauty re-assume its

its charms, along with the ease, and cheerfulness inseparable from wholesome fluids, and, from good health.

By removing the fomes, which causes Scurvies, Scrophulous, Herpetic eruptions, Leprosies, and, every kind of cutaneous foulness, whether of the red, and pimply, or the scaly, and, ulcerous kinds; I say, by gradually draining off this fomes, and, soliciting its exite from the emunctories, such foulnesses of the skin, accompanied with itchings, sores, and, even scirrhus, and, cancerous taints, will often be prevented, removed or palliated.

Chronic weakness, and, dejection of spirits, arising frequently from the same latent sources, will receive relief from the salutary, though slow operation of these Waters.

Obstructions in the uterine system, suppressions of the menstrual discharge, and, other irregularities, and, excesses peculiar to it; the fluor albus, scirrhus tumours, and, other diseases of the womb, will in many circumstances and constitutions, find a useful remedy in the Walton Waters.

Obstructions left by the long continuance, and, the frequent return of intermittent fevers, will,

will, probably, yield to a prudent use of these Waters; and, they will prepare the patient, and, put him in a fit state to receive further benefit from the Bark.

Obstructions in the lungs, from a scorbutic cause, and, acrid humours in the blood, and, inveterate ophthalmia's, have been relieved, and, are likely to be successfully treated by the Walton Water.

I shall not give many directions concerning the use of this Water, professedly similar to that of Cheltenham, the method of drinking, of which, has been long ascertained by established usage, and, the public is possessed of the directions of eminent, and, able practitioners explanatory of their experience.

The Summer Months are the season to drink the Walton Waters; as they will, in these months, and, in dry weather be in their most perfect state of impregnation.

Like Cheltenham, the Walton Waters are their own preparative; three quarters of a pint, drank at the Pump, may be taken in the morning, and afternoon, this quantity may be encreased to three half pints afterwards, if the former quantity does not sufficiently open the body.

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But I would observe, that the middle doses, such as merely preserve the body in a lax state, not exceeding three stools daily, is preferable to greater evacuation; the business and intention, being to carry off the ill digested remains of meals, perhaps of excess, and of luxury, and, of all kinds of corrupt recrementitious matter lodged in the alimentary canal, without impairing strength and digestion.

Early hours are necessary to an advantageous use of the Waters at the Well, where only they are drank without the loss of the active Volatile ingredients, which give power to those that are more fixed, to penetrate into the glands, and smallest vessels.

Exercise sub dio, is also equally proper to second the operation of the Water, and to strengthen the body.

An easy digested nutrient diet, consisting, when it agrees with the stomach, of milk in the morning and at night, of light meats and vegetables at dinner, with general temperance, and moderation in the use of vinous liquors, rather than total abstinence from them, is highly expedient.

In a situation, where excellent fish is so plentiful, it is proper to observe, that moderation in this article will be prudent, as a very frequent use of fish is found often prejudicial in diseases of the skin, and, sometimes produces the more obstinate diseases of that class; diseases, for which these Waters are peculiarly proper.

It is almost superfluous to add, that, however useful it may be to entertain the mind with pleasing society, and, an agreeable succession of amusements, it is always necessary to retire to rest at an early hour, and, before eleven o'clock at farthest to be in bed, that the constitution may have the advantage of nature's sweet restorer, balmy sleep.

In the cutaneous diseases, and, many of the affections of the glands, for which the internal use of these Waters is proper; Baths of different degrees of heat from that of common cold Water, to that of one hundred degrees of Fahrenheit's scale, will be highly expedient; this will appear in a stronger light, from what I shall offer concerning the functions, and diseases of the lymphatic glands. I apprehend, the diseases of these glands, are chiefly to be reached by the means of remedies, which are applied, so as to be absorbed by the lymphatic vessels, which pass

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to the glands. I am confident, that the most obstinate cutaneous, and glandular diseases would yield to a due perseverance in the external and internal use of Waters and other proper remedies. But what these remedies are, and, also the use, whether external or internal of Mineral Waters, and of Medicines of all kinds, which are to produce any important and salutary consequence can only be determined in particular cases, and constitutions, by the judgment of an able, and experienced physician.

THE use of Mineral Waters in diseases of the glands, leads me to offer some thoughts, which, I believe, are either new, or have not been enough attended to concerning the use, and diseases of the lymphatic glands.

The lymphatic system, which makes an important article in the anatomical discoveries of the last century, has received much improvement in this. It is not my business to assign to each improver or discoverer, his due proportion of merit. I acknowledge my obligations to them all. To Haller, Meckel, Monro, Mr. Hewson, Dr. William Hunter, and Dr. John Hunter, Mr. Sheldon, and Mr. Cruikshank; who have all contributed, and, some of them very splendily, to perfect the knowledge of this important part of the animal system; and, let them not deem it amiss, that profiting by their labours, I endeavour to make them subservient to the knowledge of the animal œconomy, and to the healing art.

That the lymphatic vessels arise from every viscus, and, from every cavity in the body,

as well as from the skin, and the cellular membrane investing the body, in prodigious, and till lately, in undiscovered numbers, is an anatomical truth of the greatest importance, now clearly demonstrated, and universally acknowledged.

The lymphatic vessels, and lacteals are of the same kind, and, constitute a system of vessels, no where connected with the veins, containing red blood; but, which universally terminate in the lacteal sac and duct, and convey chyle, and lymph collected in every part into the subclavian vein, where it mixes with the blood, and no where else.

The sole, and exclusive function of this system of vessels is absorption.

Some, indeed, have held, that the red veins are supplementary absorbents, especially on some occasions; and, the illustrious Walther, and others, with some probability, have assigned this office to the vena portarum, especially in diseases, in which the conglomerate glands of the mesentery are scirrhus, or obliterated by age, as some have supposed, or, the lacteal sac, and duct itself is obstructed. The proofs of this are equivocal, and accounted for on different principles, by the school of Hunter, particularly, by the accurate

rate Sheldon and Cruickshanks, who contend, that absorption is carried on, by the lymphatic vessels *alone*.

The lacteal, and lymphatic vessels universally pass through conglobate glands, before the fluid they convey, reaches the lacteal duct; those arising from the intestines, enter the different orders of mesenteric glands, and, the chyle and lymph deposited in these glands, is again absorbed from them by the vasa lymphatica efferentia, in order to be conveyed to the thoracic duct. (c)

This law is universal, and, the lymphatic veins wherever they arise, in no instance enter into the lacteal duct, without previously, and repeatedly throwing the lymph into the conglobate glands, which are an essential part of this system, a part of the greatest importance, for the advantage of which, the lymph is absorbed, in order to be conveyed to them; and from them the lymph is taken up in a more purified, and assimilated state, and is conveyed by the lymphatica efferentia into the lacteal sac and duct.

The structure of these glands is both vascular and cellular; into these cells the lymph is thrown, and the absorbing lymphatics,

phatics, the lymphatica efferentia, are the only excretories, to all the conglobate glands; the uses of which are acknowledged to be unknown and undiscovered, by gentlemen to whom anatomists are so much indebted, Messrs. Sheldon and Cruikshank, the latest improvers of the lymphatic system. (b)

Yet it is a matter not only interesting in the science of physiology, to ascertain their use, but is likewise necessary to enable us to understand more perfectly the diseases of the glands, and, to treat them with success: we will therefore pursue the inquiry.

A fluid is constantly exhaled into the cavities containing the viscera; this fluid is liable to be altered, either by remora or mixture; the absorption of this fluid is the function of the internal lymphatics, and, when it is prevented, either by obstruction
of

(b) The ingenious discoverers, who have lately so much improved the knowledge of the lymphatic system, all acknowledge their ignorance of the use of these glands. Mr. Cruikshank, the latest publisher on this subject, says, " Though we know something
" more of the nature, structure, and diseases, of the lymphatic
" glands, we know no more of their real use than the ancients. As
" they inform us, however, of the passage of infectious matter
" into the blood; and as from their state, we are enabled to judge
" of the presence, or absence, of other diseases; the knowledge of
" them is of great importance, in the practice of medicine.
" Anatomy of the absorbing vessels of the human body, p. 68, 69.
" Why the lymphatic's and lacteals terminate first in the glands,
" I do not know, p. 81.

"It

of the conglobate glands, or, by any other cause; Dropsies in the brain, thorax, pericardium, abdomen, and the widely diffused cellular membrane arise.

The lymph along with the chyle, and nutritious liquors prepared from the food in the intestinal canal, is absorbed by the lacteal and lymphatic vessels, for they are the same; these fluids are immediately thrown into the mesenteric glands; and, they are more numerous there than in other parts, because their office is peculiarly important, that of perfecting the chyle or nutritious fluid, extracted by digestion from food. That fluid is perfected by intercepting what is noxious in the cells of the conglobate glands, where it undergoes a digestion before it is absorbed by the second and third orders of the lacteal vessels.

Numerous lymphatic vessels, arise also from the stomach intestines, and from the glandular viscera; from the pelvis, the bladder, and parts of generation, both in males and

“ It will appear strange, that I have said nothing of the use of the absorbent glands. I avow absolute ignorance of this matter.
 “ There are none in turtle and in fish, and, only two in the necks of some birds. Why there are so many in men, and quadrupeds, I do not know, nor why they exist at all,” p. 187, &c.
 Once for all, I beg leave to express my opinion of the work now quoted, as one of the most valuable and important acquisitions, both to anatomy and medicine, this age has produced.

and females ; they observe the same law, and pass through the iliac conglobate glands, or others before they enter the lacteal sac ; and, their use is the same, to intercept crude, noxious, unassimilated matter, which has been rendered unfit by disease, or other means to mix immediately, and unaltered with the blood.

The food we take in, and the air we breath, while they convey the necessary supports of life, contain also the seeds of disease and death.

The lymphatic vessels, which arise in the mouth, and from the trachea and lungs, (where their number is immense), convey the fluids they absorb, with whatever extraneous matter has been taken up to the numerous conglobate glands of the neck, to the thyroid gland, thymus, and the glands of the lungs, where it is digested before it reaches the thoracic duct.

In young animals who take in their food by suction, in which action much is absorbed by the lymphatic's ; the glands are very large, numerous and conspicuous, the more perfectly to digest, and animalize the crude fluids received by suction with the milk.

When

When that period of life is passed over, the thyroid glands and thymus are not quite so necessary, and abate in size, but are never totally obliterated.

In pointing out the business of purifying, and animalizing lymph, as the function, of the conglobate glands in general, I believe I have discovered the use of the thymus in infants, and, of the thyroid glands, hitherto one of the hidden mysteries in anatomy. (d).

The external surface of the body, is no less absorptive, fluids are imbibed, thirst abated, urine and weight encreased from thence. Garlick, externally applied is soon smelled in the breath. Turpentine gives the urine a violet smell. Variolous matter, and the venereal poison introduced by the smallest puncture, produce similar diseases, and, previous to universal infection and diffusion, the inguinal and axillary glands, are swelled and inflamed by the passage of the poison into them. Mercury, the antidote to this poison, also enters freely by the skin. Blisters applied to the arms and shoulders inflame the axillary glands; those of the neck in children, particularly are made hard and sore by ulcers

F behind

(d) Cruikshank, speaking of the Thymus, says, "I know not the use of this gland;" and of the Thyroid gland, "as I have not the least conception of its use, I do not understand what functions in particular its absorbents perform," p. 182.

behind the ears; and in the head, and by blisters to those parts.

Ulcers and punctures in the legs, and other parts, often occasion swellings along the lymphatics up to, the axillæ or inguinal glands. Purulent bubo's arise frequently from such ulcers, and, from matter formed in the joints. The axillary glands are swelled by stagnating milk, by cancerous swellings, and inflammations in the breast. Cancers in the lips, and on the face, cause similar swellings under the lower jaw, and, in the neck. The same glands are swelled by gum boils, and, by venereal forces in the lips. Acrid matter absorbed, inflames the lymphatic vessel, and, the gland, universally, between the seat of the matter and fore, and, the thoracic duct; and, its entrance into the body, may be prevented by caustic, or, by the excision of the part. Powders scattered over the surface of the body are absorbed, thus calomel is known to enter; and, I remember a degree of salivation, and sore mouth, produced by a small quantity of corrosive sublimate, rubbed with crude sal armoniac and camphire scattered on bed linen, in order to prevent a morbus pediculofus.

When we consider these various facts, that all lymphatic vessels perpetually enter the conglobate glands, and, in the cells, of which these glands universally consist, deposite the lymph

lymph; which being absorbed once, and, again by larger lymphatics, is at length conveyed by the great channel, the lacteal duct, into the vena cava descendens, under the left clavicle. When we recollect, that the Venereal Virus, Cancerous and Variolous poisons, enter the body by these channels, and, are primarily deposited in these glands, occasioning there tumours, sometimes indolent, sometimes painful, inflamed and suppurating. It seems clear, these glands are intended by nature, to purify the lymph, before it enters the blood vessels, from matter, which may be noxious there, by arresting it in the glands, universally connected with absorbents.

In these glands, it is either altered by a concocting, and digesting power inherent in them, or, when it is too noxious to be subdued into a salutary nature, it remains in the form of a tumour, or escapes by suppuration. When it cannot be subdued, nor removed by suppuration, and, those salutary efforts of nature fail, it is then absorbed, and, diffuses disease in the constitution at large.

Thus the glands in the neck, and, the thyroid are interposed to intercept crude matter, or, noxious Virus taken up from the nostrils, mouth, trachea and lungs, and other parts

about the neck and breast, more especially in very young animals.

The mesenteric glands purify, and digest, whatever is absorbed with the lymph and chyle from the intestines.

The axillary, and inguinal glands, alter and intercept whatever extraneous matter may happen to be absorbed from the surface of the body, or the cellular membrane.

The glands have the power of assimilating into a sound fluid, such noxious matter, in very many instances. But when it is highly virulent as in the lues, in scrophulous, and in cancerous diseases, that digesting and assimilating function is overpowered, the gland remains scirrhus, or, is destroyed by supuration, and, the matter enters, and contaminates the habit.

In fine, the use of these glands is to intercept as sponges, and to alter as digestive organs, whatever is unfit to enter into the mass of blood. In ordinary cases, this is effected without obstruction, or, inflammation, and, then no apparent consequences detrimental to health appear, and, the deposited matter is absorbed again, and, goes along with the sound lymph. In extraordinary cases,

cases, the poison remains in the gland, and, destroys its powers first, and its substance, and organization afterwards.

The fatal consequences, which have followed injections of undigested alimentary fluids, directly into the red veins of living animals, are proofs that the lymphatic glands have the use and function here alledged, and, shew, that without the *lymphatic digestion*, liquors apparently harmless, are unfit to mix with the blood; and, produce fatal effects there (g).

How the glands alter, digest, and assimilate the matter absorbed, and deposited in them, I know not, and shall not attempt to explain; I think, that power implanted in them, as well as in the stomach and intestines; and, we see an important apparatus, set apart for the purpose, by Him! whose ability is too great in every instance, to be fully comprehended, and interpreted by us his creatures.

From the uses here ascribed to the lymphatic glands we see, why they are most numerous, where absorption is greatest; and, particularly in those parts, in which crude matter is absorbed. We see, why the glands are nearly as numerous in the neck as in the mesentery,

mesentery (d); for beside the matter absorbed from the inside of the mouth, nostrils and trachea; the absorbents from the brain join the glands of the neck. Though these have not been traced by anatomists; as a copious exhalation, and, absorption constantly take place in the ventricles of that organ; as we have reason to believe, the Water in the internal hydrocephalus is sometimes absorbed; from the general law, we may presume, that lymphatics exist in the brain, though not certainly traced (e); this is confirmed by the internal hydrocephalus often happening in scrophulous, and ricketty children, in whom the glands of the neck are scirrhus.

It is well known, that swellings of the glands often follow eruptive diseases. They arise after scarlet fever, measles and small-pox. Dropsy, is sometimes the consequence of them all. And I have known the hydrocephalus internus, as well as other Dropsies succeed the scarlet fever; another presumptive proof, that absorption in the brain, is carried on by lymphatic vessels as well as in other parts.

We also, see why the glands are more numerous in the mesentery, through which all the chyle passes, and are smaller, and less numerous

(d) P. 130. (e) P. 127, Cruikshank.

numerous in the mesocolon, through which, hardly any chyle passes, whence Mr. Cruikshank is led to say, "this looks as if the glands were intended to produce some remarkable change in the chyle" (f).

The mesenteric glands, as well as the conglobate glands in other parts, being cellular, as well as vascular, contain a white milky fluid, most conspicuous, and abundant in young animals. *Album perpetuo reperi*, says, Haller, *Elem. Phys. T. 1.*

These glands, though greatly less in adults than in young animals, are yet not totally obliterated. The illustrious Haller, has seen the thymus in the mediastinum, and the glands in the mesentery, and in the intestinum rectum in adults; in children, they are very large and succulent, *Elem. Phys. T. 1. p. 192.*

The lymphatic vessels being destitute of the moving impulse of the heart, and having no other principle of motion to carry on the liquors absorbed, but that of the irritability of the lymphatic system, the motion of the lymph is necessarily liable to be obstructed. Hence obstructions happen more frequently in the conglobate and lymphatic glands, than
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(f) P. 127.—of Cruikshank.

in the conglomerate glands. The liver may be excepted, because the blood conveyed into it by the vena portarum, undergoes a similar retardation in that very singular vein.

The conglobate glands, are hence universally liable to scirrhusity and obstruction. The mesenteric glands are notoriously liable to great enlargement and hardness, and thereby often cause a slow consuming fever and atrophy in infants. Similar swellings in the mesenteric glands are sometimes observed from ulcerated intestines after dysentery. The neck is seldom strumous without accompanying obstruction in the mesenteric glands.

The thyroid axillary and mammary glands, as well as the iliac lumbar and inguinal glands are all frequently found obstructed and scirrhus. In a word these glands are not only obstructed in venereal and cancerous habits; but the scrophula and rachitis, likewise originate in them, and are principally stated in the glands.

In all cases of obstructed glands, the chyle and lymph, being imperfectly assimilated, the blood becomes gradually vitiated, and, unfit for nourishment. Hence that acrimony often called scorbutic; an ulcerous and even cancerous disposition of fluids originate. From
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the same source the bones become brittle, break in some, and, are rendered soft and flexible in others.

All these facts conspire to shew the importance of the digestive, and assimilating power of the glands, and, lymphatic system, in perfecting the animal fluids.

In diseased glands, the chyle is not sufficiently assimilated, and, that defect gradually induces acrimony, and impurity in the lymph, which soon taints the blood and habit universally.

It is more from this defect, than from the entrance of the chyle into the blood, being prevented by obstruction, that marasmus, and consumption follow scirrhusities in the mesenteric glands.

“ It is possible,” says, the ingenious Cruikshank, “ that children, and, even grown persons, may have died of the tabes mesenterica from obstructions in the glands, rendering them impervious to the chyle.” But he never saw any such stagnation of chyle, as these are supposed to cause, on any occasion whatever (h).

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(h) P. 107, Cruikshank.

The lymph, and chyle, enters the blood but in a corrupted, crude, unanimalized state.

I am confirmed in this opinion, by the experiments of another excellent Anatomist, Mr. Sheldon, which I shall quote from his splendid History of the Human Lacteal Vessels.

In subjects, in which the lymphatic glands of the mesentery, were found entirely obstructed, sometimes by a curd-like substance, sometimes by calcareous earth, Mr. Sheldon, could push injections of quicksilver from the vessels, below the obstructed glands, to those above them, though not a single particle of quicksilver, could be made to enter the glands in this obstructed state. In this case, the collateral branches of the lacteal vessels, which communicated with those above, were enlarged, and, had conveyed the chyle into the lacteal duct.

The ingenious Dr. Cheston, found the cavity of the lacteal duct totally obstructed for a considerable length, by an earthy matter, in a man who had a Spina Ventosa of the os ilium.

It is probable, the chyle, in this case, was conveyed from below, into the lacteal duct,
above

above the obstruction, by one or more collateral anastomosing branches, which are every where numerous in the lymphatic vessels, and, frequent in the lacteal duct itself. This being a provision of nature, for securing more certainly, a regular conveyance of the chyle into the blood vessels.

But, I remember a melancholy case, which shews the thoracic duct, sometimes is obstructed in a fatal degree; a young lady, high in rank, beautiful in person, and amiable in disposition; had a swelling in the neck, which extended itself under the left clavicle, and, there obstructed the entrance of the thoracic duct into the subclavian vein so completely, as to render her incurably dropsical in every part of her body.

What I have now offered, concerning the use of the glands, belonging to the lymphatic system, will, I apprehend, derive support from the late discoveries, and, will be found useful in the treatment of diseases of the glands.

Medicines taken into the stomach, and, mixed with the chyle, are, indeed, in the direct channel, to reach the diseased glands of the mesentery.

But this is not the case, respecting the conglobate glands in other parts. Medicines mixing with the blood, never directly reach these glands, and, but very remotely, and indirectly affect them; and, this is one of the reasons why, diseases, in these glands, have always appeared so stubborn, and, have so rarely yielded to the common treatment, and internal use of Medicine.

The confiding alone to Medicines, conveyed by the lacteals into the channel of circulation; the inattention to the only entrance into external diseased glands, that by absorption, are, I am persuaded, causes why those diseases have proved so obstinate, and rebellious to Medical treatment.

It is the cause why the scrophula, and scirrhous glands, have become cancerous, and finally incurable and fatal.

It is evident then, that the remedies proper for removing obstructions should be applied to such parts, from whence the lymphatic's arise, which may absorb, and conduct them to the glands, the obstructions of which are to be removed.

Applications intended to remove glandular swellings in the neck, the thyroid gland, the
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bronchocele, &c. must be made to the head, neck, cheeks, and mouth internally, as well as externally.

Vapours inhaled by inspiration, are proper in the diseased glands of the lungs.

Remedies intended to pass into the axillary glands, must be applied to the arms and breast.

In diseases of the inguinal glands, the remedies intended to pass into them, and through them, must be applied to the genitals, and to the legs and thighs.

The advantages found from the local application of Mercury in Venereal swellings of the inguinal, and axillary glands, and in ulcers of the throat, exemplify this doctrine in that disease.

The holding Medicines intended to remove the bronchocele, and swelled neck, in the mouth, and under the tongue, is essential to give efficacy to those Medicines, as has been long experienced, in the Coventry Medicine. The saline ingredients, whether alkaline, or neutral, of which such Medicines usually consist, are absorbed by the lymphatic vessels arising in the inside of the mouth, and,
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are conveyed directly to the diseased glands, with constant good effect.

Internal obstructions in the mesentery in particular are to be relieved by internal Medicines; and, in every kind of glandular obstruction Mineral Waters have been found highly necessary and useful.

The Chalybeate, the sulphureous, the saline, the hot, and the cold Waters, have all been tried with advantage.

Of laxative medicines, the purgative Mineral Waters, always operate with the least diminution of strength, and, with the least disturbance; the appetite is for the most part mended under their use, and, important alterations in the whole system, arise from continuing to apply to them. Their operation principally affects the first passages in clearing away what is recrementitious, and hurtful in that seat and source of corruption.

They next directly operate on the lacteal vessels and glands; they dilute the chyle, and stimulate the lacteals themselves, which are sufficiently irritable, and remove thereby, both the source of obstruction, and the obstructions, which may have taken place in the conglobate glands of the mesentery.

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In this manner, they contribute to the purity, and perfection of the chyle and lymph, and, remove all obstacles, to its perfect digestion in the intestinal canal, and in the lacteal vessels and glands.

Hence, this source of tainted fluids being taken away from the chyle and blood, and, no new acrimonious deposition falling on the remoter parts of the body, the lymphatic vessels and glands, there, reassume their functions, and absorb, and digest what was before lodged on the skin, and on the adjacent parts of the surface of the body.

Thus, under the use of such Waters, continued for a sufficient length of time, depositions, eruptions, and defecations of the skin, with ulcers, and glandular swellings disappear. It is thus the Harrowgate, Cheltenham and Walton Waters prove beneficial.

The Sea Water, acts not only as a powerful internal remedy in the same diseases ; but has its efficacy greatly promoted by bathing ; washing thereby away much cutaneous foulness, and, removing more by being directly absorbed into the lymphatic's, and conveyed to the diseased glands ; at the same time, that a useful spring and vigour is given to the whole constitution,

I might

I might illustrate the practical importance of these principles by cases, but this letter, being already too long, I now commit it to your consideration. To you! who, joining reading to experience, and talents, make the healing art your study and delight.

From you, my humble, but zealous endeavours to excite the attention of the younger, and, liberal Gentlemen of the profession, to improved methods of curing diseases, are sure of a candid reception.

As to others, whose sole pursuit and study is gain;

*Quærenda pecunia primum est,
Virtus post nummos.*

I have not wrote for them, and, have certainly no attention to expect from them.

I am, &c.

JAMES JOHNSTONE.

WORCESTER,
August 20, 1787.

F I N I S.